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No. II

SCIENCE AND INDUSTRY

Woman's Work in Germany

BY a recent census it appeared that of some twenty-six million women in Germany, twenty-five per cent. were wage earners, as against seventeen and five-tenths per cent. in the United States. One-third of the entire number of German working women were engaged in agricultural pursuits. Recently it was true that there were only nine women physicians in Germany, as compared with seven hundred in Russia, and five thousand in the United States.

The admission of women to the German universities will effect a great change in the ratio of the number of women in professional pursuits to that of the women engaged in agriculture.

Explosion by Music

ONE of the most dangerous of all explosives is a black powder called iodide of nitrogen. When it is dry the slightest touch will often cause it to explode with great violence.

There appears to be a certain rate of vibration which this compound cannot resist. In experiments to determine the cause of its extreme explosiveness, some damp iodide of nitrogen was rubbed on the strings of a bass viol. It is known that the strings of such an instrument will vibrate when those of a similar instrument, having an equal tension, are played upon. In this case, after the explosive had become thoroughly dry upon the strings, another bass viol was brought near and the strings sounded. At a certain note the iodide of nitrogen on the prepared instrument exploded.

It was found that the explosion occurred only when a rate of vibration of sixty a second was communicated to the prepared strings. Vibration of the G string caused an explosion, while that of the E string had no effect.

The Goose Traffic of Berlin

THE traffic in geese at Berlin amounts to nearly two million dollars a year. As the domestic supply is wholly inadequate, a special goose train of from fifteen to forty cars arrives daily from the Russian frontier. Each car is specially built, and carries about twelve hundred geese. There is a rigid inspection by sanitary officials immediately upon the arrival of the train.

Should it be found that a single goose has died or been ill of a contagious disease in transit, the entire carload is quarantined for eight days. If during this period of quarantine another goose should die, the quarantine is extended for eight days, at a cost of about five hundred dollars to the owners. The penalty attaching to the bringing in of diseased geese makes the owners extremely careful to import only sound and healthy fowl. The geese which are plump and ready for market are sold to dealers at the close of the inspection. The rest, comprising the great majority, go to feeding farms in the suburbs of the city to be fattened for market.

There is a special market near the great market place at which *bracken*—namely, geese injured en route, but having no disease—are sold at a reduced price. Twenty-one different varieties of the Russian goose are commercially recognized, and the wholesale price varies from forty-four to sixty cents a bird.

Plants as Workers for Mankind

PROFESSOR STRAKOSCH, an eminent scientist of Vienna, has recently been making a study of plants from a new point of view. Taking those species which are of economic importance,—that is to say, the vegetables, cereals, etc., which are of value to the human race,—he has assembled them, so to speak, in his agricultural laboratory, and determined with definite accuracy their efficiency as workers for man.

In other words, he has considered them as if they were so many hirelings of the farm, ascertaining by a series of painstaking experiments just how much each one costs for its keep, as it were, and how much it produces. The object in each case has been to find out how great a quantity of digestible food material the plant under examination yields to the acre, and how much in value it takes from the soil in order to accomplish the result. This learned, it is easy enough to strike a balance, and to determine the amount of clear profit.

All wealth comes originally from the soil. The so called economic plants are the workers that create wealth for the human race. By their efforts we are fed and supported. It is of obvious importance, therefore, that we should know which of them are the most efficient and capable,—producing the largest output, in terms of value, for the least expenditure.

It would appear from the figures summarizing results obtained by Professor Strakosch that the most efficient of all economic plants is the Jerusalem artichoke. This justly valued vegetable produces, on an acre of good land, about 7,127 pounds of starch and other digestible substances. It takes from the soil, incidentally, \$26 worth of material. But the difference between consumption and production, in terms of value, is \$116.

One might imagine that the potato would be away up at the head of the list; but it is not so. The beet comes next with an output of 6,384 pounds of digestible substances to the acre, taking \$41 worth of material out of the soil, and yielding a clear balance of \$112.

Third in order is corn, which produces 4,562 pounds of digestible substances, consuming \$17 worth of material, and giving a balance on the credit side of \$108 for the acre.

These, then, are the three most efficient economic plants—the best workers for man, that is to say. The potato is fourth on the list. Taking \$4 worth of material out of the soil for each acre planted, it yields 4,449 pounds of digestible substances (nearly all starch), and shows a balance of \$72 on the credit side. Rice gives 2,254 pounds, taking \$5 worth from the land, and allows a balance of \$45. Peas produce 1,864 pounds, drawing on the bank to the extent of \$2, and give the farmer a clear \$40 to the acre. Carrots yield 4,198 pounds, with an expenditure of \$17 worth of plant food, and show a margin of \$61 to the good. Rye affords an output of 1,824 pounds of nutrients, at a cost of \$10 to the soil, and furnishes a profit of \$26. A crop of crimson clover withdraws from the land hardly more than one-twentieth of the quantity of valuable material consumed by timothy.

The greatest of all starch producers is the Jerusalem artichoke, which in this respect is away ahead of the potato. For each acre of land it yields a greater quantity of nutrients than the potato by considerably more than one-third. The beet comes next to the artichoke as a starch producer; then the potato; and next in order Indian corn. The greatest of all producers of digestible albuminoids (which go to make muscle and blood) is the soy bean. But ordinary beans and peas are so rich in such substances, as well as in starch, as to yield more nourishment, pound for pound, than lean beefsteak.

Spiders Set a Style in Lace Making

SOME two hundred years ago missionaries taught the natives of Paraguay to make lace by hand. The art has been handed down from generation to generation, and in some of the towns lace making is the chief occupation. Almost all the women and children and many of the men are engaged in it.

A singular fact about Paraguayan laces is that the designs are borrowed from the curious webs spun by the semitropical spiders that abound in that country. For this reason the lace is called by the natives *nanduti*, an Indian word that means "spider web."

To Aim Straight Is Human

ANTHROPOLOGISTS have remarked that taking aim is a human characteristic that even the anthropoid apes cannot be said to share. Apes and monkeys frequently throw nuts and sticks, sometimes with unpleasant consequences to others; but they show little or no ability to take accurate aim. The baboon is said to excel somewhat in this respect; but still it would never pass for a marksman.

Accuracy of eye and the judgment of direction and distance that are involved in real aiming have been developed only by man, and are among the tokens of his intellectual superiority.

Origin of Right Handedness

ACCORDING to one good authority, Dr. Cunningham of London, this characteristic is of great antiquity, and was attained in the ordinary evolution of man by natural selection. But the condition does not reside in the right arm itself; for all the evidence goes to show that it is due to functional preeminence on the left side of the brain. This superiority of the left brain rests upon some structural foundation, the origin of which is not explained, but which is transmitted from parent to offspring.

Left handedness is due to the transference of this structural peculiarity from the left to the right side of the brain, or, more probably, to a transposition of the cerebral hemispheres, like that which sometimes occurs in the thoracic and abdominal viscera.

The Sense of Smell

ACCORDING to an eminent authority, the tenth part of a grain of musk will continue for years to fill a room with its odoriferous particles, and at the end of that time will not be appreciably diminished in weight by the finest balance.

A cubic inch of air arising from the flame of a Bunsen burner has been found to contain no fewer than four hundred and eighty-nine million dust particles.

A drop of blood that might be suspended from the point of a needle contains about a million of red flattened corpuscles.

Still, though matter is so remarkably divisible, the olfactory nerves are infinitely more sensitive. Much has yet to be investigated with regard to the differentiation of the points in these nerves so that they may discriminate with such apparently miraculous accuracy; yet even the results in the scent of dogs show how wonderfully fine is their discriminating power. Our sense of smell, unless in the trained chemist, is not even so acute as that of the semisavage.

Much have we gained by civilization; but not without some loss to our bodily energies and senses. Man's recuperative power after an injury is said frequently to be in inverse ratio to his social advancement. Similarly he seems to become less acute and delicate in the sense of smell as he fares better and lives more comfortably.

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